

ABSTRACT OF DISCLOSURE

The present invention includes a process for selectively etching a low-k dielectric material formed on a substrate using a plasma of a gas mixture in a plasma etch chamber. The gas mixture comprises a fluorine-rich fluorocarbon or hydrofluorocarbon gas, a nitrogen-containing gas, and one or more additive gases, such as a hydrogen-rich hydrofluorocarbon gas, an inert gas and/or a carbon-oxygen gas. The process provides a low-k dielectric to a photoresist mask etching selectivity ratio greater than about 5:1, a low-k dielectric to a barrier/liner layer etching selectivity ratio greater about 10:1, and a low-k dielectric etch rate higher than about 4000 Å/min.